

Attorney Docket No. ACT-111  
Application No. 09/519,165

13. (Twice Amended) An etched ptoelectronic apparatus comprising:

- B2  
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P1
- a) a semiconductor substrate having an etched pit with semiconductor sidewalls;
  - b) a dielectric layer disposed on the semiconductor substrate, wherein the dielectric layer is planar and has a hole with dielectric sidewalls, wherein the dielectric sidewalls are aligned with the semiconductor sidewalls;
  - c) a patterned metal layer disposed directly on the dielectric layer, wherein the patterned metal layer has sidewalls aligned with the dielectric sidewalls and semiconductor sidewalls; and
  - d) an optical component in the etched pit.

B3

24. (Amended) An etched optoelectronic apparatus comprising:

- a) a semiconductor substrate having an etched pit with semiconductor sidewalls;
- b) a dielectric layer disposed on the semiconductor substrate, wherein the dielectric layer is planar and has a hole with dielectric sidewalls, wherein the dielectric sidewalls are aligned with the semiconductor sidewalls;
- c) a patterned metal layer disposed directly on the dielectric layer, wherein the patterned metal layer has sidewalls aligned with the dielectric sidewalls and semiconductor sidewalls, and wherein the patterned metal layer includes a U-shaped patterned metal area, with the etched pit disposed inside the U-shaped patterned metal area; and
- d) an optical component in the etched pit.

B4

27. (Amended) An etched optoelectronic apparatus comprising:

- a) a semiconductor substrate having an etched pit with semiconductor sidewalls;
- b) a dielectric layer disposed on the semiconductor substrate, wherein the dielectric layer is planar and has a hole with dielectric sidewalls, wherein the dielectric sidewalls are aligned with the semiconductor sidewalls;
- c) a patterned metal layer disposed directly on the dielectric layer, wherein the patterned metal layer has sidewalls aligned with the dielectric sidewalls and semiconductor sidewalls;
- d) a patterned metal pad disposed on the dielectric layer;

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C1*

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- e) solder disposed on the patterned metal pad; and
- f) an optoelectronic device on the solder.